

2/10/04

09/893,477

FILE 'REGISTRY' ENTERED AT 15:11:16 ON 10 FEB 2004

L1 577 S (1303-00-0 OR 22398-80-7 OR 106070-25-1 OR
106603-89-8 OR 106604-01-7 OR 106604-03-9)/RN OR (IN P SB OR
AS GA SB OR AS GA OR IN P)/ELF OR (IN.P.SB OR AS.GA.SB OR
AS.GA OR IN.P)/MF

FILE 'HCAPLUS' ENTERED AT 15:11:17 ON 10 FEB 2004

L2 516322 S GRAD?
L3 4214 S M!FET# OR HEMT OR ELECTRON#(2A)MOBIL?(2A)TRANSISTOR?
L4 277099 S CHANNEL#
L5 QUE VARIE## OR VARIABLE? OR VARY#### OR PROFIL?
OR INCREAS#### OR DECREAS#### OR CHANG? OR LARGE? OR SMALL? OR
LOW OR LOWER? OR LOWEST OR HIGH OR HIGHE##
L6 QUE PROPORTION##### OR RELATION? OR WIDE####
OR BROAD OR BROADE? OR NARROW#### OR TAPER#### OR CONTRACT##
OR CONTRACTING OR REDUC##### OR ATTENUAT? OR COMPRESS####
L7 QUE EXPAN##### OR THIN? OR THICK? OR SPLAY? OR
FUNCTION#### OR INHOMOGENOUS? OR NONUNIFORM? OR (UN OR
NON) (2A) (UNIFORM OR HOMOGEN? OR CONSTANT?) OR "NOT UNIFORM" OR
"NOT HOMOGENOUS" OR "NOT CONSTANT"
L8 QUE COMPOSITION? OR RATIO? OR AMOUNT? OR CONCENTRATION? OR DISTRIBUT?
L9 2509275 S ((L5 OR L6 OR L7 OR L8)) (5A)L8
L10 5042 S L1 AND L2
L11 84 S L10 AND L3
L12 18437 S L9 AND L1
L13 292 S L12 AND L3
L14 105 S L13 AND L4
L15 174 S L11 OR L14
L16 135134 S (((VARIE##/TI OR VARIABLE?/TI OR VARY####/TI OR PROFIL?/TI OR
INCREAS####/TI OR DECREAS####/TI OR CHANG?/TI OR LARGE?/TI OR SMALL?/TI OR LOW/TI OR
LOWER?/TI OR LOWEST/TI OR HIGH/TI OR HIGHE##/TI) OR (PROPORTION#####/TI OR
RELATION?/TI OR WIDE####/TI OR BROAD/TI OR BROADE?/TI OR NARROW####/TI OR TAPER####/TI
OR CONTRACT##/TI OR CONTRACTING/TI OR REDUC#####/TI OR ATTENUAT?/TI OR
COMPRESS####/TI) OR (EXPAN#####/TI OR THIN?/TI OR THICK?/TI OR SPLAY?/TI OR
FUNCTION####/TI OR INHOMOGENOUS?/TI OR NONUNIFORM?/TI OR (UN/TI OR
NON/TI) (2A) (UNIFORM/TI OR HOMOGEN?/TI OR CONSTANT?/TI) OR "NOT UNIFORM"/TI OR "NOT
HOMOGENOUS"/TI OR "NOT CONSTANT"/TI) OR (COMPOSITION?/TI OR RATIO?/TI OR AMOUNT?/TI OR
CONCENTRATION?/TI OR DISTRIBUT?/TI))) (5A) (COMPOSITION?/TI OR RATIO?/TI OR AMOUNT?/TI
OR CONCENTRATION?/TI OR DISTRIBUT?/TI))
L17 185481 S GRAD?/TI OR L16
L18 25 S L15 AND L17
L19 840 S (1303-00-0 OR 22398-80-7 OR 106070-25-1 OR
106603-89-8 OR 106604-01-7 OR 106604-03-9)/RN OR (IN P SB OR
AS GA SB OR AS GA IN OR GA IN SB OR AS IN P)/ELF OR (IN.P.SB
OR AS.GA.IN OR AS.GA.SB OR GA.IN.SB OR AS.IN.P)/MF
L20 2123 S L17 AND L19
L21 11 S (L2 OR L9) (5A)L4 AND L20 AND L3
L22 16 S L18 NOT L21
L23 QUE MAX OR MAXIM? OR MIN OR MINIMUM? OR PEAK? OR VALLEY? OR (V OR U) (2A) (SHAPE?
OR PROFIL? OR GRAD? OR DISTRIB?)
L24 1032 S L23 AND (L2 OR L9) (5A)L4
L25 165838 S (L19 OR L1)
L26 53 S L24 AND L25

L22 ANSWER 13 OF 16 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1996:700493 HCAPLUS
 TI Molecular beam epitaxy growth of indium-rich $\text{In}_x\text{Ga}_{1-x}\text{As}/\text{In}_y\text{Al}_{1-y}\text{As}/\text{InP}$ structures towards high **channel** conductivity for a high **electron mobility transistor** using a linearly **graded** buffer layer
 AU Hong, Sang-Ki; Lee, Hae-Gwon; Lee, Jae-Jin; Kim, Sang-Gi; Pyun, Kwang-Eui; Park, Hyung-Moo
 SO Journal of Crystal Growth (1996), 169(3), 435-442
 CODEN: JCRGAE; ISSN: 0022-0248
 AB $\text{In}_x\text{Ga}_{1-x}\text{As}/\text{In}_y\text{Al}_{1-y}\text{As}$ heterostructure with both **high** electron mobility and **high** carrier **concentration** was fabricated on InP substrate by MBE. The measured electron mobilities were 11,491 $\text{cm}^2/\text{V}\cdot\text{s}$ at 300 K and 53,316 $\text{cm}^2/\text{V}\cdot\text{s}$ at 77 K for two-dimensional electron gas concns. of 4.7×10^{12} and $3.5 \times 10^{12} \text{ cm}^{-2}$, resp. The **high** electron mobility and **conc** resulted from the dislocation-free, relatively thick (200 Å), and high indium content (80%) **channel** layer. The high-quality $\text{In}_x\text{Ga}_{1-x}\text{As}$ **channel** layer was successfully grown at a growth temperature of 520° after introducing a linearly **graded** $\text{In}_y\text{Al}_{1-y}\text{As}$ buffer structure grown at a reduced growth temperature of 420°. The cross-sectional TEM observation revealed that the dislocations generated due to a large lattice mismatch between $\text{In}_y\text{Al}_{1-y}\text{As}$ and InP substrate were locked up in the middle of the **graded** buffer layer. Probably the authors have achieved to date for this materials system the highest room-temperature conductivity (mobility times carrier concentration) of $5.4 \times 10^{16} \text{ V}\cdot\text{s}$.
 IT **22398-80-7**, Indium phosphide (InP), properties 106097-59-0, Gallium indium arsenide ($\text{Ga}_{0.47}\text{In}_{0.53}\text{As}$) 106312-11-2, Aluminum indium arsenide ($\text{Al}_{0.48}\text{In}_{0.52}\text{As}$) 111446-08-3, Gallium indium arsenide ($\text{Ga}_{0.25}\text{In}_{0.75}\text{As}$) 111592-95-1, Gallium indium arsenide ($\text{Ga}_{0.35}\text{In}_{0.65}\text{As}$) 123213-49-0, Aluminum indium arsenide ($\text{Al}_{0.25}\text{In}_{0.75}\text{As}$) 124546-56-1, Aluminum indium arsenide ($\text{Al}_{0.35}\text{In}_{0.65}\text{As}$)
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (MBE growth of indium-rich $\text{In}_x\text{Ga}_{1-x}\text{As}/\text{In}_y\text{Al}_{1-y}\text{As}/\text{InP}$ structures towards high **channel** conductivity for a high **electron mobility transistor**)

L22 ANSWER 14 OF 16 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1996:393266 HCAPLUS
TI Carrier mobilities in **graded** InxGal-xAs/Al0.2Ga0.8As quantum wells for high **electron mobility transistors**
AU Strass, U.; Bernklau, D.; Riechert, H.; Finkbeiner, S.
SO Journal of Applied Physics (1996), 80(1), 322-325
CODEN: JAPIAU; ISSN: 0021-8979
AB The authors investigate modulation-doped InxGal-xAs/Al_yGa_{1-y}As quantum wells grown by mol. beam epitaxy with respect to carrier mobility and its dependence on In content, In distribution, populations of electron subbands, and local positions of electron wave functions. The authors find that the room-temperature electron mobilities are dominated by the In contents at the maxima of the electron wave functions rather than by the average In contents. At 77 K the mobilities are most strongly influenced by the distance between doping layers and the maxima of the electron wave functions. As a practical result of this study, we present a quantum well structure for high **electron mobility transistors (HEMTs)** with a carrier mobility as high as 8100 cm²/V s at 295 K for an electron d. of 2.5+10¹² cm⁻².
IT **106070-25-1**, Gallium indium arsenide 106312-09-8, Aluminum gallium arsenide (Al_{0.2}Ga_{0.8}As)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(carrier mobilities in **graded** InxGal-xAs/Al_{0.2}Ga_{0.8}As quantum wells for high **electron mobility transistors**)

L21 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1995:889432 HCAPLUS
 TI Degradation of InGaAs high **electron mobility transistors**: the role of **channel composition** and **thickness**
 AU Meshkinpour, M; Goorsky, M S.; Streit, D C.; Block, T R.; Wojtowicz, M
 SO Materials Research Society Symposium Proceedings (1995), 378(Defect and Impurity Engineered Semiconductors and Devices), 783-87
 CODEN: MRSPDH; ISSN: 0272-9172
 AB The authors examined the performance of AlGaAs/InGaAs/GaAs pseudomorphic high **electron mobility transistors** with varying channel layer thicknesses for In mole fractions of 0.21 and 0.24. For both **compos.**, there is an optimum **channel thickness** above which the device performance is impaired. As expected the effective critical thickness of the In_{0.21}Ga_{0.79}As layer is higher. Surprisingly, however, TEM of the device structures indicates that the device performance is not impaired by the presence of a linear array of misfit dislocations. In fact, the devices with highest performance have misfit dislocations indicating that defect engineering may lead to improved performance in these structures. Also, device structures with poor performance have misfit dislocations along both of the <110> directions. Triple axis x-ray diffraction provides a nondestructive estimate of the dislocation densities present.
 ST degrdn **HEMT** gallium indium arsenide; **channel thickness compn** degrdn transistor; misfit dislocation .
 IT 106495-76-5, Aluminum gallium arsenide (Al_{0.25}Ga_{0.75}As)
 112003-92-6, Gallium indium arsenide (Ga_{0.76}In_{0.24}As)
 115454-37-0, Gallium indium arsenide (Ga_{0.79}In_{0.21}As)
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
 (effects of **channel composition** and **thickness**
 on performance of aluminum gallium arsenide/gallium indium
 arsenide/gallium arsenide pseudomorphic **HEMT**)

L21 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1995:600140 HCAPLUS
TI High-performance InP-based **HEMT's** with a **graded**
pseudomorphic **channel**
AU Chough, K. B.; Hong, Brian W-P.; Caneau, C.; Song, J. I.; Jeon, K. I.;
Hong, S. C.; Lee, K.
SO Conf. Proc. - Int. Conf. Indium Phosphide Relat. Mater., 6th (1994),
427-30 Publisher: IEEE, New York, N. Y.
CODEN: 60XAAN
AB Al_{0.48}In_{0.52}As/Ga_{1-x}In_xAs pseudomorphic **HEMT's** with very high gate and channel
breakdown voltages were successfully fabricated. To improve the breakdown
characteristics, graded pseudomorphic Ga_{1-x}In_xAs and Al_{0.2}In_{0.8}P were adopted as
a channel and Schottky layer, resp. Systematic studies reveal that the
modification of the quantum-well **channel** by **grading** the **composition** considerably
changes the **channel** breakdown (BVds) and output conductance (go) characteristics.
HEMT's with **graded** Ga_{1-x}In_xAs **channel** (x = 0.7 to 0.6) exhibited improved BVds
(11 V) and go (40 mS/mm) compared with **HEMT's** with uniform composition (x = 0.7)
in the channel (BVds = 4 V and go = 80 mS/mm).
IT **106097-59-0**, Gallium indium arsenide (Ga_{0.47}In_{0.53}As)
106312-11-2, Aluminum indium arsenide (Al_{0.48}In_{0.52}As) **107103-00-4**
, Gallium indium arsenide (Ga_{0.3}In_{0.7}As) **110602-51-2**, Gallium
indium arsenide (Ga_{0.4}In_{0.6}As) **112173-69-0**, Gallium indium
arsenide (Ga_{0.3-0.47}In_{0.53-0.7}As) 124504-14-9, Aluminum indium phosphide
(Al_{0.2}In_{0.8}P) **167978-53-2**, Gallium indium arsenide
(Ga_{0.3-0.4}In_{0.6-0.7}As)
RL: DEV (Device component use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(fabrication of aluminum indium arsenide/gallium indium arsenide
pseudomorphic **HEMTs** with very high gate and channel breakdown
voltages)

L21 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1995:531679 HCAPLUS
 TI **Graded-channel** InGaAs-InAlAs-InP high **electron mobility transistors**
 AU Streit, Dwight c.; Block, Thomas R.; Wojtowicz, Michael; Pascua, Dimas; Lai, Richard; Ng, Geok I.; Liu, Po-Hsin; Tan, Kin L.
 SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1995), 13(2), 774-6
 CODEN: JVTBD9; ISSN: 0734-211X
 AB The authors have fabricated pseudomorphic InGaAs-InAlAs-InP high **electron mobility transistors** by MBE with $\text{In}_x\text{Ga}_{1-x}\text{As}$ **channels graded** from $x = 0.60$ to $x = 0.80$. Compared with device profiles using flat $x = 0.80$ channels the channel conductivity is improved by 24%. Hall mobility is improved from 10,750 to 12,200 $\text{cm}^2/\text{V s}$ at 295 K with sheet charge N_s of 3.6×10^{12} and $3.9 \times 10^{12} \text{ cm}^{-2}$ for the flat $x = 0.80$ and **graded-channel** profiles, resp. **Graded-channel** devices with 0.1 μm T gates obtained cutoff frequency $f_T = 305 \text{ GHz}$ and maximum frequency of oscillation $f_{\text{max}} = 340 \text{ GHz}$.
 IT **22398-80-7**, Indium phosphide, properties **106097-59-0**, Gallium indium arsenide ($\text{Ga}_{0.47}\text{In}_{0.53}\text{As}$) **106312-11-2**, Aluminum indium arsenide ($\text{Al}_{0.48}\text{In}_{0.52}\text{As}$) **107103-00-4**, Gallium indium arsenide ($\text{Ga}_{0.3}\text{In}_{0.7}\text{As}$) **107827-20-3**, Gallium indium arsenide ($\text{Ga}_{0.2}\text{In}_{0.8}\text{As}$) **110602-51-2**, Gallium indium arsenide ($\text{Ga}_{0.4}\text{In}_{0.6}\text{As}$) **111592-95-1**, Gallium indium arsenide ($\text{Ga}_{0.35}\text{In}_{0.65}\text{As}$) **164111-19-7**, Gallium indium arsenide ($\text{Ga}_{0.2-0.4}\text{In}_{0.6-0.8}\text{As}$)
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (characterization of **graded-channel**
 InGaAs-InAlAs-InP high **electron mobility transistors**)

L21 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1995:344634 HCAPLUS
 TI 0.10 μm **graded** InGaAs **channel** InP **HEMT**
 with 305 GHz f_T and 340 GHz f_{max}
 AU Wojtowicz, M.; Lai, R.; Streit, D. C.; Ng, G. I.; Block, T. R.; Tan, K.
 L.; Liu, P. H.; Freudenthal, A. K.; Dia, R. M.
 SO IEEE Electron Device Letters (1994), 15(11), 477-9
 CODEN: EDLEDZ; ISSN: 0741-3106
 AB The authors report here 305 GHz f_T , 340 GHz f_{max} , and 1550 mS/mm extrinsic g_m
 from a 0.10 μm In_xGa_{1-x}As/In_{0.52}Al_{0.48}As/InP **HEMT** with x graded from 0.60 to
 0.80. This device has the highest f_T yet reported for a 0.10 μm gate length and
 the highest combination of f_T and f_{max} reported for any three-terminal device.
 This performance is achieved by using a **graded-channel** design which
 simultaneously **increases** the effective indium **composition** of the **channel** while
 optimizing **channel** thickness.
 IT **22398-80-7**, Indium phosphide, properties 106312-11-2, Aluminum
 indium arsenide (Al_{0.48}In_{0.52}As) **107827-20-3**, Gallium indium
 arsenide (Ga_{0.2}In_{0.8}As) **110602-51-2**, Gallium indium arsenide
 (Ga_{0.4}In_{0.6}As) **164111-19-7**, Gallium indium arsenide
 (Ga_{0.2-0.4}In_{0.6-0.8}As)
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (elec. properties of **graded channel** high
electron mobility transistor from)

L21 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1994:233305 HCAPLUS
TI A high-performance δ -doped GaAs/InxGal-xAs pseudomorphic high **electron mobility transistor** utilizing a **graded** InxGal-xAs **channel**
AU Shieh, Hir Ming; Hsu, Wei Chou; Hsu, Rong Tay; Wu, Chang Luen; Wu, T S
CS Dep. Electr. Eng., Natl. Cheng Kung Univ., Tainan, Taiwan
SO IEEE Electron Device Letters (1993), 14(12), 581-3
CODEN: EDLEDZ; ISSN: 0741-3106
AB A new δ -doped GaAs/InGaAs/GaAs pseudomorphic high **electron mobility transistor** utilizing a **graded** In **composition** InGaAs **channel** grown by low-pressure metalorg. chemical vapor deposition was demonstrated. This new structure revealed an extrinsic transconductance as high as 175 (245) mS/mm and a saturation c.d. as high as 500 (690) mA/mm at 300 (77) K for a gate length of 2 μ m. The maximum transconductance vs. gate bias extended a broad and flat region of more than 2 V at 300 K. In addition, a low gate leakage current (<10 μ A at -7 V) at 300 K was obtained.
IT **106070-25-1**, Gallium indium arsenide **136770-03-1**, Gallium indium arsenide ga0.75-0.8in0.2-0.25as
RL: USES (Uses)
(high **electron mobility transistor** based on graded, with gallium arsenide, fabrication and characteristics of)
IT **107498-92-0**, Gallium indium arsenide ga0.8in0.2as
RL: USES (Uses)
(high **electron mobility transistor** based on, with gallium arsenide, fabrication and characteristics of)

L21 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 2001:868847 HCAPLUS
 TI High **electron mobility transistor**
 semiconductor structures with **graded** layer and **channel**
 layer over donor/barrier layer
 IN Hoke, William E.; Lemonias, Peter J.; Kennedy, Theodore D.
 PA Raytheon Company, USA
 PI US 6489639 B1 20021203 US 2000-577508 20000524
 PRAI US 2000-577508 A 20000524
 WO 2001-US40379 W 20010326
 AB A semiconductor structure, e.g., a high **electron mobility transistor** structure,
 is formed by using metamorphic growth and strain compensation. The structure
 includes a substrate, a graded layer over the substrate, a 1st donor/barrier
 layer over the **graded** layer, and a **channel** layer over the 1st donor/barrier
 layer. The substrate has a substrate lattice constant, and the graded layer has
 a graded lattice constant. The graded layer has a 1st lattice constant near a
 bottom of the graded layer substantially equal to the substrate lattice constant
 and a 2nd lattice constant near a top of the graded layer different than the 1st
 lattice constant. The 1st donor/barrier layer has a 3rd lattice constant, and the
 channel layer has a 4th lattice constant. The 2nd lattice constant is
 intermediate the 3rd and 4th lattice constants.
 IC ICM H01L029-778
 ICS H01L021-335
 ST high **electron mobility transistor**
graded channel donor barrier layer
 IT High-**electron-mobility transistors**
 Molecular beam epitaxy
 (high **electron mobility transistor**
 semiconductor structures with **graded** layer and
channel layer over donor/barrier layer)
 IT **107498-91-9**, Gallium indium arsenide (Ga_{0.7}In_{0.3}As) X
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PROC (Process); USES (Uses)
 (relaxed contact layer; high **electron mobility**
transistor semiconductor structures with **graded** layer
 and **channel** layer over donor/barrier layer)
 IT **22398-80-7**, Indium phosphide, processes
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PROC (Process); USES (Uses)
 (substrate; high **electron mobility**
transistor semiconductor structures with **graded** layer
 and **channel** layer over donor/barrier layer)

L21 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 2000:201513 HCAPLUS
TI Study of doping **concentration** variation in InGaAs/InP
high electron mobility transistor
layer structures by Raman scattering
AU Radhakrishnan, K.; Patrick, T. H. K.; Zheng, H. Q.; Zhang, P. H.; Yoon, S.F.
SO Journal of Vacuum Science & Technology, A: Vacuum, Surfaces, and Films
(2000), 18(2), 713-716 (Mar/Apr issue)
CODEN: JVTAD6; ISSN: 0734-2101
AB The effect of varying the dopant concentration (ND) in the InP donor layer of
* In_{0.53}Ga_{0.47}As/InP high-**electron-mobility transistor (HEMT)** structure was studied
by Raman scattering measurements. The carrier concentration in the InGaAs
channel was found to **increase** when the doping **concentration** in the donor layer
was increased assuming that the donors are fully ionized. The coupled mode
between the InGaAs longitudinal optical phonons and the electrons in the InGaAs
channel shifts continuously to a lower wave number with the increase in the value
of ND in the InP donor layer. The correlation between the observed Raman shift
with the carrier concentration in the channel layer can be used to characterize
the **HEMT** structures nondestructively.
ST gallium indium arsenide high **electron mobility**
transistor doping; indium phosphide high **electron**
mobility transistor doping
IT Doping
High-**electron-mobility transistors**
(study of doping concentration variation in gallium indium arsenide/indium
phosphide high-**electron-mobility transistor**
layer structures by Raman scattering)
IT **22398-80-7**, Indium phosphide, uses **106097-59-0**, Gallium
indium arsenide (Ga_{0.47}In_{0.53}As)
RL: DEV (Device component use); USES (Uses)
(study of doping concentration variation in gallium indium arsenide/indium
phosphide high-**electron-mobility transistor**
layer structures by Raman scattering)

L22 ANSWER 11 OF 16 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1999:333246 HCAPLUS
 TI Room-temperature photoreflectance and photoluminescence characterization of the AlGaAs/InGaAs/GaAs pseudomorphic high **electron mobility transistor** structures with **varied** quantum well **compositional profiles**
 AU Lin, D. Y.; Liang, S. H.; Huang, Y. S.; Tiong, K. K.; Pollak, Fred H.; Evans, K. R.
 SO Journal of Applied Physics (1999), 85(12), 8235-8241
 CODEN: JAPIAU; ISSN: 0021-8979
 AB Using room-temperature photoreflectance (PR) and photoluminescence (PL) the authors have characterized four pseudomorphic AlGaAs/InGaAs/GaAs high **electron mobility transistor** structures with **varied** quantum well **compositional profiles**. Several features from the InGaAs modulation doped quantum well portion of the samples were observed in addition to signals from the AlGaAs, GaAs, and GaAs/AlGaAs superlattice (SL) buffer layer. The PR spectra from the InGaAs quantum well **channel** can be accounted for by a line shape function which is the 1st derivative of a step-like two-dimensional d. of states and a Fermi level filling factor. A detailed line shape fit makes it possible to evaluate the Fermi energy, and hence the concentration of two-dimensional electron gas in addition to the energies of the intersubband transitions. The lowest lying intersubband transition was confirmed by a comparison of the PR and PL spectra. From the difference of intersubband transition energies, the surface segregation effects of In atoms are demonstrated. Other important parameters of the system such as built-in elec. field, Al composition, as well as the properties of the GaAs/AlGaAs SL buffer layer are evaluated.
 IT 106070-25-1, Gallium indium arsenide
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (**compositional profile**; room-temperature photoreflectance and photoluminescence characterization of AlGaAs/InGaAs/GaAs pseudomorphic high **electron mobility transistor** structures with **varied** quantum well **compositional profiles**)
 IT 37382-15-3, Aluminum gallium arsenide ((Al,Ga)As) 107874-87-3, Aluminum gallium arsenide al0.24ga0.76as 108424-56-2, Gallium indium arsenide ga0.78in0.22as y
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (room-temperature photoreflectance and photoluminescence characterization of AlGaAs/InGaAs/GaAs pseudomorphic high **electron mobility transistor** structures with **varied** quantum well **compositional profiles**)

L22 ANSWER 12 OF 16 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:41812 HCAPLUS
TI Room-temperature phototransmittance and photoluminescence characterization of the AlGaAs/InGaAs/GaAs pseudomorphic high **electron mobility transistor** structures with **varied** quantum well **compositional profiles**
AU Lin, D. Y.; Huang, Y. S.; Tiong, K. K.; Pollak, F. H.; Evans, K. R.
SO Semiconductor Science and Technology (1999), 14(1), 103-109
CODEN: SSTEET; ISSN: 0268-1242
AB We have studied the effects of the two-dimensional electron gas (2DEG) and indium surface segregation in four pseudomorphic AlGaAs/InGaAs/GaAs high **electron mobility transistor** structures using room-temperature phototransmittance (PT) and photoluminescence (PL) measurements. The PT spectra from the InGaAs modulation-doped quantum well **channel** can be accounted for by a lineshape function which is the first-derivative of a step-like two-dimensional d. of states and a Fermi level filling factor. A detailed lineshape fit makes it possible to evaluate the Fermi energy, and hence the concentration of 2DEG in addition to the energies of the intersubband transitions. The lowest-lying intersubband transition was confirmed by a comparison of the PT and PL spectra. From the difference of intersubband transition energies, the surface segregation effects of indium atoms are demonstrated.
IT 108424-56-2, Gallium indium arsenide (Ga_{0.78}In_{0.22}As)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(quantum well; photoluminescence of AlGaAs/InGaAs/GaAs high **electron mobility transistors** with indium surface segregation from quantum well **channel** layer)